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ABSTRACT

This paper reports on an intervention program adopted by 73 North York, Ontario, elementary schools and used with 595 first grade pupils identified as likely to experience limited school success. Criteria for pupil selection were teachers' ratings, performance on the reading and numbers subtests of the Metropolitan Achievement Test (MAT) and the North York Primary Self Concept Inventory. Implementation was carried out by teachers and volunteers, including parents, university students and grade 6 pupils. Before and after studies demonstrated a gain in MAT and self concept scores and a change in class distribution scores. Follow-up studies on intervention are briefly described. (MS)

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A STUDY OF KINDERGARTEN TEACHERS' PREDICTIONS OF THEIR PUPILS' SUBSEQUENT PERFORMANCE AND THE EFFECTS OF AN INTERVENTION PROGRAM AT THE GRADE 1 LEVEL

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Philosophy of Intervention

Too often the conventional school program demands, through its presentation of academic material, that the child use skills which he has never developed, or tries to build on experiences that the child has never had, or requires the utilization of a concept yet unestablished.

Further, in terms of social skills, there are often discrepancies between skills that the school program demands and the skills that a particular child has acquired. There is considerable evidence that pupils are unlikely to achieve competence in school if they do not have a healthy self-concept or are unable to have effective relationships with both peers and adults.

Such factors as the child's age, language experiences, development of social and academic activities upon entry to school, bear heavily on the likelihood of initial school success.

Consequently, the early identification of children who are most likely to experience limited success in the present school program is considered an important goal by both educators and parents. The question facing schools, therefore, is

> What can we do to improve the chances of school success for pupils identified as likely to experience difficulties?

The answer, though not easily attained, is that schools can intervene with such identified pupils by utilizing available human and material resources to provide appropriate learning experiences for the individual child. The purpose of this intervention process is to prevent potential learning difficulties from becoming actual learning problems.

Intervention is not a packaged program. It is an on-going process aimed at individualization of learning for children at the earliest possible stage of their school careers. It is a process that focuses on social and academic learning of children and one that concerns itself with the growth of individuals.

Kindergarten Teachers' Predictions

Many studies have indicated that systematic observation of children's behaviour in the classroom has provided useful data for early identification of educationally high risk children. Most often, the major source of behavioural data in these studies has been the classroom teacher.

For example, Ebbesen at the University of Illinois found significant correlations between kindergarten teachers' ranking of their pupils' predicted achievement in the primary grades and the pupils' achievement as measured by the Metropolitan Achievement Test in Grades 1 and 2.

In 1971, North York initiated a similar study in 14 elementary schools. Kindergarten teachers were asked to rank their pupils in terms of their achievement, and secondly, to predict (on a five point scale) the progress of these pupils by Grade 3.

During the 1973-74 school year, when those pupils with normal progression would be in Grade 3, measures of achievement in Math Computations and Word Knowledge (Metropolitan Achievement Test) as well as Self Concept were collected. In order to determine whether the scores on these measures were anticipated by the kindergarten teachers, the data were analyzed using the chi-square technique. Raw scores on each of the two achievement measures and Self Concept were divided into five categories based on an inspection of their frequency distributions. Chi-square tables were then established showing the number of pupils in each category as a function of their kindergarten teacher rating. Table 1 shows the distribution of Word Knowledge scores for only two teacher rating categories, the top rating and the bottom rating.

TABLE 1

CHI SQUARE DISTRIBUTIONS FOR WORD KNOWLEDGE SCORES AND THE EXTREME TEACHER PREDICTION RATINGS

TEACHER RATINGS	Achievement Categories* High 1	2	3	4	Low 5	TOTALS
1 High	17 (5.8)	18 (9.0)	33 (36.1)	9 (12.4)	2 (15.8)	79
2						113
3						136
4 Low	0 (5.0)	3 (7.8)	20 (31.1)	15 (10.7)	30 (13.6)	68
TOTALS	29	45	181	62	79	396

* The number in brackets represents the number of students you would expect to fall in that category by chance alone.

The actual number of pupils who received a high teacher rating and whose Word Knowledge score fell in the top two achievement categories was 35, while by chance, one would expect only 15 pupils to have scores in these categories. On the other hand, 45 pupils who received the lowest teacher rating, obtained Word Knowledge scores in the bottom two achievement categories, while by chance one would expect only 25 pupils.

The Chi-square values obtained for each of the three measures were significant, indicating that in the case of the academic measures, the probability that the

actual distribution of scores would occur by chance alone is less than one in a thousand, and less than one in a hundred for the Self Concept test. We concluded, therefore, that kindergarten teachers can predict with a fair degree of accuracy, the subsequent academic performance of their pupils. It is important to realize, however, that this conclusion is based on group results; on an individual basis, there are exceptions.

Now, these might sound like cold hard statistics with little educational significance, but let me elaborate briefly on the implications of what I'm saying.

When we have brought these kinds of results to our Principals in North York and suggested that something needs to be done for those children who are rated low by their kindergarten teachers, some principals have said that we should leave these children alone, they'll mature. If we try to do something with them, we will just be initiating self-fulfilling prophesies. However, as you can see from Table 1, 45 of the 68 pupils who received low ratings from their kindergarten teacher, in Grade 3, obtained scores in the two bottom achievement categories, and indeed, 30 are in the very bottom achievement category. Further, 23 of these 30 pupils were still in Grade 2, so they hadn't matured yet! Well, you might say, in terms of their maturation level, these pupils are now with their peers and will probably do well now. However, the results of another study we have done, suggest that this is not the case. We looked at a sample of Grade 6 pupils and found that those who had repeated at least one year from K - 6 tended to have low self concepts and be poor achievers. Often therefore, our myths are dead wrong and can lead to decisions which condemn children to failure.

Now that we have some evidence that kindergarten teachers can be fairly good predictors of future academic success, what can schools do to improve the chances of school success for those pupils identified as in need of help.

Intervention: Pilot Study

In 1972 - 73, North York initiated an intervention program on a pilot basis in 16 Grade 1 classrooms. Pupils, hypothesized as likely to experience limited school success, were identified by means of (a) kindergarten teacher ratings, (b) their performance on the reading and numbers subtests of the Metropolitan Achievement Test, and (c) a Self Concept Inventory. The test results for the total class plus a list of the identified pupils were taken to the Grade 1 teachers early in the fall, by one of our Research Consultants.

To assist the teacher in providing additional help for these pupils, volunteers were recruited from a variety of sources: parents, university students, Grade 6 pupils. Each teacher organized her own program, consequently volunteers were used in a variety of ways.

Post-testing on the achievement and self concept tests occurred in May and gain scores were calculated for both identified and non-identified pupils to determine the extent of growth. The identified pupils showed greater than expected gains on both numbers and self concept and met the expectation on the reading subtest. The non-identified pupils made greater than expected gains on self concept and reading.

Intervention: 1973 - 74

These results were made available to all elementary principals throughout North York early in September, 1973. As a consequence, 73 of 112 elementary schools elected to participate in the Intervention Program during the 1973-74 school year.

Approximately 4,000 Grade 1 children were tested in the fall using the Reading and Numbers subtests of the Metropolitan Achievement Test and the North York Primary Self Concept Inventory. As well, the kindergarten teachers were asked to rate the pupils on a five point scale in terms of two factors:

1. Pupils' expected achievement in Grade 1.
2. Likelihood of the pupil experiencing social difficulties in Grade 1.

On the basis of these five pieces of information, a pupil was identified if his scores were:

(a) one standard deviation or more below his class average on two of the three measures of achievement, i.e. M.A.T. Reading, M.A.T. Numbers and Teacher Rating of Achievement,

and

(b) one standard deviation or more below his class average on one of the two social measures, i.e. Self Concept Inventory and Teacher Rating of Social Difficulties,

Using these criteria, 595 or 15% of the 4,000 pupils were selected.

As soon after pre-testing as possible, each participating Grade 1 teacher received a report for her class which included:

- a list of all pupils in the class, with their pre-test scores on each of the five measures,
- the class average on each of the five measures,
- a list of the identified pupils in the class and their areas of greatest weakness.

As in the pilot study, teachers were again encouraged to use volunteers as an additional resource in their program.

Post-testing occurred during the first three weeks in April, 1974. Pupils were again asked to complete the M.A.T. Reading, M.A.T. Numbers and Self Concept Inventory.

As in the fall, a feedback report was personally delivered to each teacher, which included:

- pre-test scores on all measures for each pupil,
- post-test scores on all measures for each pupil,
- gain scores, i.e. a measure of the extent of growth from fall to spring, on each measure for each pupil,
- class average and standard deviation on each measure for pre-test, post-test and gain scores.

Results

Table 2 shows the average standard scores obtained by the identified pupils on the Metro Achievement Subtests.

TABLE 2

AVERAGE STANDARD SCORES AND CORRESPONDING GAINS ON READING AND NUMBERS FOR IDENTIFIED PUPILS

		Pre-Test	Post-Test	Actual Gain	Expected Gain
READING	Average Score	22.1	30.6	8.4	7.0
	Standard Deviation	4.6	5.5	5.3	
	Number of Pupils	585	474	465	
NUMBERS	Average Score	20.7	33.9	13.0	11.0
	Standard Deviation	5.4	7.9	7.5	
	Number of Pupils	594	477	473	

You can see that the identified pupils made gains on both measures. In the case of reading, the standard score gain of 8.4 means that on the average, pupils were able to correctly complete 15 more items on the post-test than on the pre-test. On the numbers test, pupils also obtained 15 more items correct on the post-test than on the pre-test.

The differences between actual and expected gains would occur by chance less than one time in a thousand.

TABLE 3

AVERAGE SELF CONCEPT SCORES* - IDENTIFIED PUPILS

	Pre-Test	Post-Test	Gain
Average Score	23.2	25.8	2.5
Standard Deviation	6.8	6.3	7.6
Number of Pupils	587	469	462

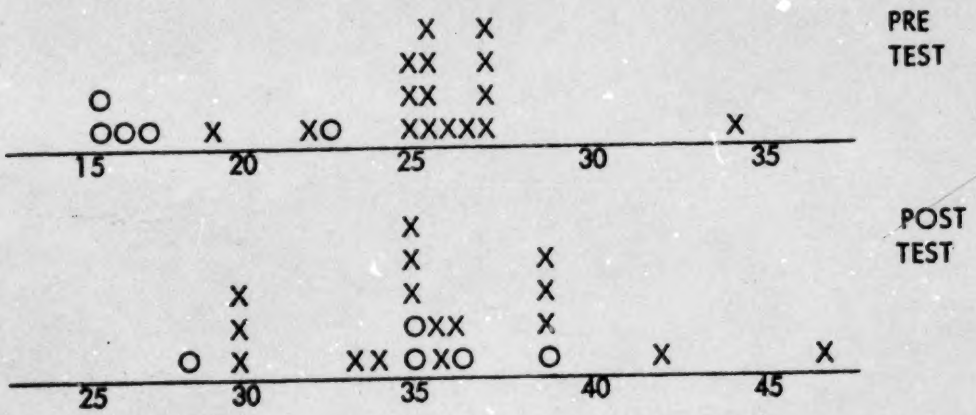
* Maximum score possible is 40.

Now, in terms of Self Concept, you can see that the identified pupils on the average improved their score from pre-test to post-test.

These are the results for the total group of identified pupils. Now let me show you what the results look like for an individual class.

FIGURE 1

DISTRIBUTION OF READING SCORES ON PRE-TEST AND POST-TEST FOR IDENTIFIED AND NON-IDENTIFIED PUPILS IN ONE CLASS



O = Identified pupils

X = Non-Identified pupils

On the pre-test, pupil scores ranged from 15 - 34; the identified pupils, designated by circles, are clustered at the bottom of the distribution. On the post-test, the scores ranged from 25 - 47, so that as a group, the whole class has shown some improvement. However, note the position of the scores for the identified pupils. They are no longer clustered in a group at the bottom of their class distribution, but are now intermingled among the scores for the rest of the class. These pupils have quite dramatically changed their position relative to their initial performance in the fall.

Table 4 presents the achievement results for the total group of non-identified pupils.

TABLE 4

AVERAGE STANDARD SCORES AND GAINS OBTAINED ON MEASURES OF READING AND NUMBERS BY NON-IDENTIFIED PUPILS

	Pre-Test	Post-Test	Actual Gain	Expected Gain
Average Score	29.6	37.4	8.2	8.0
Standard Deviation	5.7	6.3	4.9	
Number of Pupils	3153	3091	2600	
Average Score	30.8	44.1	13.8	17.0
Standard Deviation	8.9	9.9	8.3	
Number of Pupils	3134	3109	2603	

The non-identified pupils also made gains on both measures of academic achievement. On the reading test, the pupils, on the average, obtained 30 items correct on the post-test, out of a possible 33. This represents a gain of 9 items as compared with the pre-test. On the numbers test, non-identified pupils, on the average, completed 30 out of a possible 34 items correctly. This also represents a gain of 9 items as compared with their performance on the pre-test. Although the non-identified pupils did not achieve their expected gain in numbers, the difference represents only one item. In terms of Self Concept, the non-identified pupils maintained their scores on the average from pre-test to post-test.

TABLE 5

AVERAGE SELF CONCEPT SCORES
NON-IDENTIFIED PUPILS

	Pre-Test	Post-Test	Gain
Average Score	28.2	28.4	0.3
Standard Deviation	5.8	6.1	6.4
Number of Pupils	3142	3078	2586

In some of our secondary analyses, we have asked some questions about the characteristics of the identified pupils. For example, are there equal numbers of boys and girls?

TABLE 6

PERCENT OF BOYS AND GIRLS
IN SAMPLE

	BOYS	GIRLS
IDENTIFIED	60	40
NON-IDENTIFIED	49	51

As you can see, among the identified pupils, there are more boys than girls, while among the non-identified sample there are approximately equal representations of boys and girls.

Another question we had was - "Is there a tendency for the identified pupils to be born during the last quarter of the year?

TABLE 7

PERCENT OF IDENTIFIED AND NON-IDENTIFIED PUPILS

BORN IN EACH QUARTER OF THE YEAR

	January - March	April - June	July - September	October - December
Identified	15	22	29	35
Non-Identified	26	26	25	23

The non-identified sample is distributed across the four quarters - approximately equally, as you would expect. Among the identified pupils, however, a small percentage were born during the period January - March, while a larger percentage than you would expect were born during October - December. Thus, if you are a boy and born during October, November or December, there is a much greater probability that you may have potential learning problems in school.

Intervention: 1974 - 75

This year, at the Grade 1 level, intervention is an on-going program, and no longer a research study. At the teachers' request, we have put together an Intervention Handbook based on (a) discussions with teachers, (b) classroom observations and (c) responses from teachers to a questionnaire, to provide some practical guidelines for teacher reference. The Handbook provides suggestions for learning activities, volunteer sources and appropriate volunteer tasks.

We have carried the research study on to the Grade 2 level and will be collecting data in the spring and writing a report next June.

We are also involved this year in a study, funded by the Ministry to examine in more depth, what is happening to identified pupils in their classrooms, which seems to have beneficial results.

Thirty Grade 1 teachers who volunteered to participate in the study have been assigned to one of three treatment conditions which vary in terms of the sources of assistance made available to the teacher:

1. information regarding their pupils' performance on academic and social measures early in the school year. These teachers have no volunteers.

2. student volunteers who assist the teacher on a regular basis. These teachers received no feedback regarding their pupils' performance on the pre-test.

3. both feedback of test information and student volunteers on a regular basis.

In addition to standardized test information, we are observing teacher-pupil interaction in the 30 classrooms.

A report of this study will be submitted to the Ministry next summer. We hope it will provide further insights into the intervention process.